

taken along the axial direction of the optical waveguide during consecutive steps of fabrication process.

Figs. 5A to 5C are sectional views of the EA-DFB module taken along lines Va-Va, Va-Va and Vc-Vc, respectively, in Figs. 5 4B, 4B and 4C.

Figs. 6A and 6B are graphs showing current-voltage characteristics of the EA-DFB module of the present embodiment and the conventional EA-DFB module, respectively.

Fig. 7 is a partially cutout perspective view of a 10 conventional EA-DFB module.

Figs. 8A and 8B are sectional views taken along lines VIIIa-VIIIa and VIIIb-VIIIb, respectively, in Fig. 8.

#### PREFERRED EMBODIMENT OF THE INVENTION

Now, the present invention is more specifically described 15 with reference to accompanying drawings.

Referring to Fig. 1, an EA-DFB module generally designated by numeral 10 is of a SI-PBH type and includes a Fe-InP layer acting as an electron trapping layer in an EA modulator 20 according to an embodiment of the present invention. The EA-DFB module 10 includes a DFB laser diode formed in the DFB laser area 10A and the EA modulator formed in the EA modulator area 10B, which are integrated in a monolithic structure and co-axially arranged on a common n-InP substrate 11 in the direction 25 of axis of the optical waveguide.